DELTEC

PowerRite Pro II Rack-Mount UPS

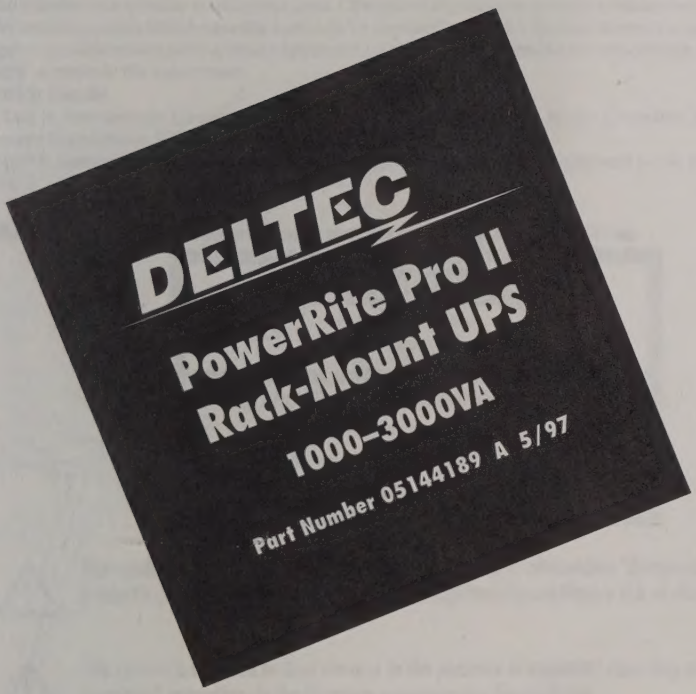
1000–3000VA

Part Number 05144189 A 5/97

OWNER'S MANUAL

MP MASTER

MA26203



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FCC AND ICES CLASS A STATEMENT

For Users in the United States Only

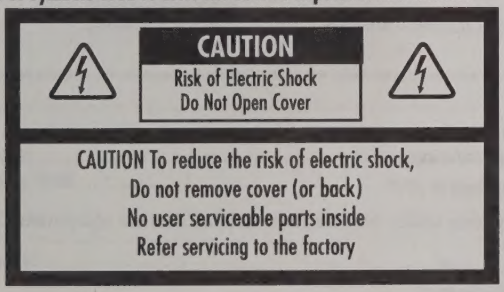
Note: This equipment has been tested and found to comply with the limits for a Class A digital device pursuant to Part 15 of FCC Rules. These limits are designed to provide reasonable protection against harmful interference when this equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his/her own expense. Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

For Users in Canada

This Class A Interference Causing Equipment meets all requirements of the Canadian Interference Causing Equipment Regulations ICES-003.

Cet appareil numerique de la classe A respecte toutes les exigences du Reglement sur le materiel brouileur du Canada.

The following are examples of symbols used to alert the user to important information:


CAUTION
Risk of Electric Shock
Do Not Open Cover
CAUTION To reduce the risk of electric shock,
Do not remove cover (or back)
No user serviceable parts inside
Refer servicing to the factory

This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

This symbol indicates that you should not discard the UPS or the UPS batteries in the trash. UPS may contain sealed lead-acid batteries. Batteries must be recycled.

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Declaration of Conformity

according to the
Low Voltage Directive, 73/23/EEC, the EMC Directive, 89/336/EEC,
including amendments by the CE-marking directive, 93/68/EEC

Type of Equipment:	Uninterruptible Power System
Brand Name / Trademark:	Deltec Electronics PowerRite Pro II Rack and Exide NetUPS SE Rack
Type Designation / Model:	PRC-RM-i series
Manufacturer:	Deltec Electronics Corporation 2727 Kurtz Street, San Diego, CA, 92110, USA Phone: (619) 291-4211, Fax: (619) 291-2973

The following harmonized European standards have been applied:

Standards	Regarding
EN 50091-1:1993	Electrical Safety
EN 60950:1992+A1:1993+A2:1993+A3:1995	Electrical Safety
EN 50091-2:1995	EMC

Additional Information

We have an internal production control system that ensures compliance between the manufactured products and the technical documentation.

The Product was CE-marked in 1997.

As manufacturer, we declare under our sole responsibility that the equipment follows the provisions of the Directives stated above.

Wayne Gerow
Director, Quality Assurance
Deltec Electronics Corporation

Dated 2/15/97

Contents

PREFACE

PowerRite Pro II Rack-Mount—One of the Best! 1

How to Contact Us 2

SECTION 1

Installation 3

Inspecting Your Equipment 3
Safety Precautions 3
Mounting the UPS in a Rack 4
Installing the UPS 4

SECTION 2

Operation 7

Turning the UPS On 7
Turning the UPS Off 7
Interpreting the LED Display 7
Putting the UPS in Standby Mode 9
Initiating the Self Test 9
Silencing an Audio Alarm 10
Resetting the Circuit Breaker 10

SECTION 3

Configuration 11

Why Change Factory Defaults? 11
Input Nominal Voltage (LEDs 1, 2, 3, and 10) 11
Extended Nominal Voltage Range (LED 4) 11
Other Settings 11
Reconfiguring Functions 12

SECTION 4

Maintenance 15

Replacing Batteries 15
When to Replace Batteries 15
How to Replace Batteries 16
Testing New Batteries 17
Returning the Used Battery 17
UPS/Battery Care and Storage 17
Storing the UPS 17
UPS Repairs 18

SECTION 5

Troubleshooting Guide 19

APPENDIX A
SPECIFICATIONS 21

APPENDIX B
UPS REAR PANELS 24

APPENDIX C
ADDITIONAL UPS FEATURES 26
Communication Port Configurations 26
Remote Emergency Power Off Switch (REPO) 27
Option Slot 28
Load Segments 28

APPENDIX D
HARDWIRING THE UPS 29
Pre-Installation Considerations 29
Steps to Hardwiring the UPS 30

LIST OF FIGURES
Figure 1. PowerRite Pro II Rack-Mount UPSs 2
Figure 2. Typical UPS Installation 5
Figure 3. Interpreting LEDs in Operation Mode 8
Figure 4. LED Function in Configuration Mode 13
Figure 5. Replacing Batteries 16
Figure 6. 120 Volt Models 24
Figure 7. 230 Volt Models 25
Figure 8. Hardwired Model 25
Figure 9. Communication Port 26
Figure 10. REPO Port 28
Figure 11. Terminal Block 32

LIST OF TABLES
Table 1. Interpreting LEDs in Operation Mode 9
Table 2. How to Interpret LEDs in Configuration Mode 14
Table 3. Troubleshooting Guide 19
Table 4. Model List 21
Table 5. Electrical Input 21
Table 6. Electrical Output 22
Table 7. Battery 22
Table 8. Indicators and Controls 22
Table 9. Physical Properties 23
Table 10. Communication Port Configuration 27
Table 11. Wire Selection Guide 30
Table 12. Circuit Breaker Size Guide 31
Table 13. UPS Input and Output Connection Guide 33

PREFACE

PowerRite Pro II Rack-Mount —One of the Best!

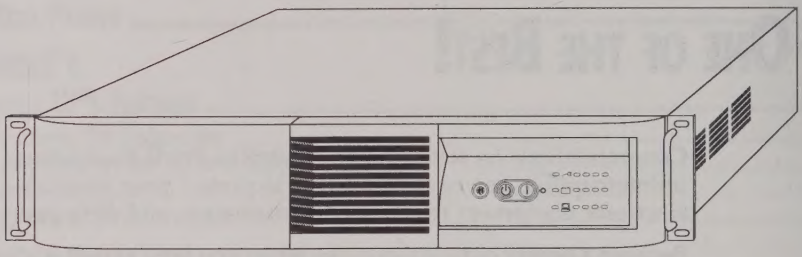
Congratulations on selecting the PowerRite Pro II Rack-Mount uninterruptible power system (UPS) to protect your sensitive electronic equipment from power disturbances and dirty power.

Because a power outage can occur when you least expect it — threatening the loss of critical data — it's important to protect your network with a full-featured UPS such as the PowerRite Pro II Rack-Mount. Network administrators often spend countless hours trying to troubleshoot problems that, in many cases, would never have occurred had a UPS protected their network.

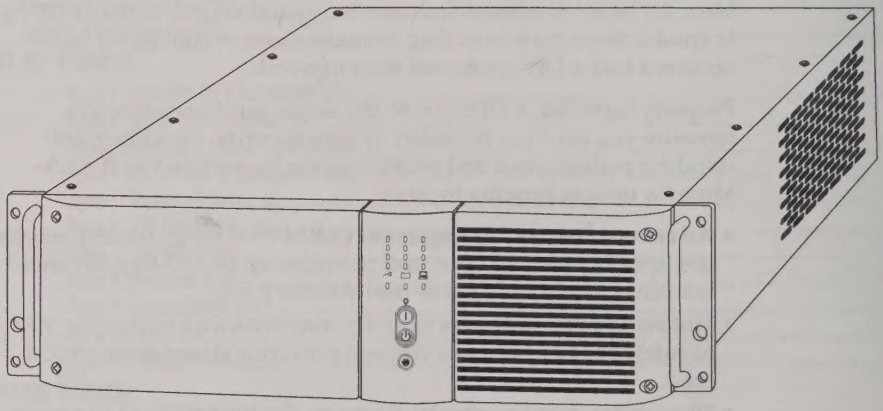
Properly installed, a UPS can be the single most cost-effective measure you can take to ensure system security. Providing outstanding performance and reliability, the PowerRite Pro II Rack-Mount's unique benefits include:

- **Advanced Battery Management (ABM™)** doubles battery service life, speeds recharge time, and provides up to a 60-day advanced warning prior to the end of useful battery life.
- **Hot swappable batteries** simplify maintenance by allowing you to safely replace batteries without powering down your critical load.
- **10-year pro-rated warranty** gives you the highest level of protection in the industry. Be sure to complete and return the warranty card at the back of the manual.
- **Buck and Double Boost voltage regulation** ensures consistent voltage to your load by correcting voltage fluctuations without using battery power.
- **Start-on-battery** compatibility allows you to power up your UPS even if utility power is not available.
- **LanSafe III and FailSafe III power management software** is fully compatible with the PowerRite Pro II Rack-Mount and provides sequential orderly shutdown of all network devices including multiple servers and workstations.

- **Optional power communication cards** provide enhanced communication capabilities for increased power protection and longer battery backup times.



1000 & 1500 VA



2000 – 3000 VA

Figure 1. PowerRite Pro II Rack-Mount UPSs

How to Contact Us

Deltec is committed to excellence in dependability and customer satisfaction. If you have any questions about our products, please contact the Sales department at: 1-800-854-2658.

SECTION 1

INSTALLATION

This section explains:

- Inspecting equipment
- Safety precautions
- Mounting your UPS in a 19" rack
- Installing your UPS

Inspecting Your Equipment

If any equipment has been damaged during shipment, keep the shipping cartons and packing materials for the carrier or place of purchase and file a claim for shipping damage. If you discover damage after acceptance, file a claim for concealed damage.

To file a claim for shipping damage or concealed damage: 1) File with the carrier within 15 days of receipt of the equipment; 2) Send a copy of the damage claim within 15 days to your Customer Service representative.

Safety Precautions

Read the following before you install your UPS.

IMPORTANT SAFETY INSTRUCTIONS

SAVE THESE INSTRUCTIONS. This manual contains important instructions that should be followed during installation and maintenance of the UPS and batteries. Please read all instructions before operating the equipment and save this manual for future reference.

WARNING

- Electrical Energy Hazard. The battery pack contains HIGH ENERGY. To reduce the risk of electric shock, use caution when you handle and interconnect the units.
- If operating the UPS unplugged from the source of electrical power, DO NOT make contact with the line cord input pins. Electrical Shock hazard exists.
- To reduce the risk of fire or electric shock, install in a temperature and humidity controlled indoor area free of conductive contaminants.
- (VDE requirement) The sum of earth leakage current from all loads connected to the UPS must not exceed 1.5 mA.

Mounting the UPS in a Rack

The UPS fits into a standard 19-inch rack. The following steps explain mounting the UPS in a rack.

CAUTION

The UPS is heavy. It is mandatory that a minimum of two people lift and place the UPS in its rack.

1. Using at least two people, lift the unit and slide it into the rack.
2. Secure the UPS by screwing the mounting angles to the rack face (screws not provided).

The unit is now secured in the rack. See Installing the UPS.

Installing the UPS

Follow these steps to install your UPS. Figure 2 shows a typical installation; installing your specific model may vary. Appendix B shows the rear panel configuration of each model. If you have a hardwired UPS, see Appendix D for installation instructions.

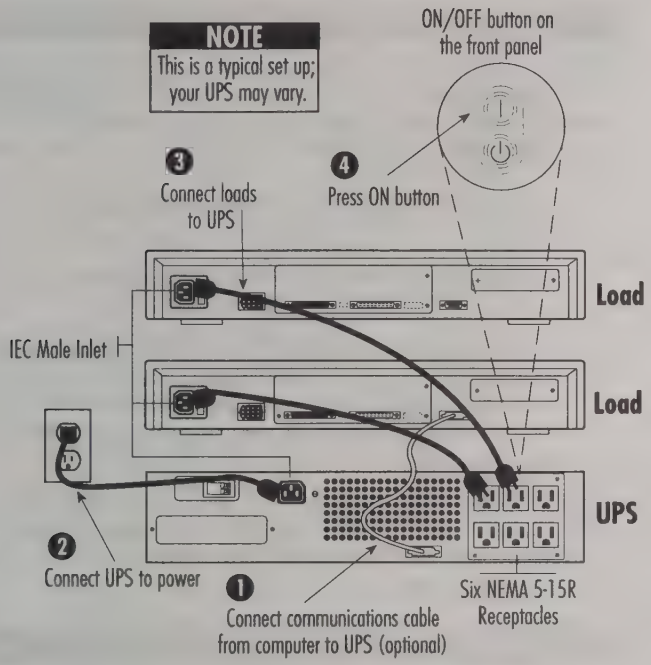


Figure 2. Typical UPS Installation

CAUTION

A small amount of arcing may occur when connecting an external battery to the UPS. Insert the battery cable into the UPS battery connector quickly and firmly.

NOTE

- Output receptacles are divided into Load Segments. If you plan to take advantage of this feature (available only with specific power management software) read the appropriate sections of your power management software manual before you install the UPS.
- Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

1. If you plan to use UPS power management software, connect your computer's communication cable to the UPS RS-232 port.

NOTE

If you have a 50 Hz, 100 V outlet, you must reconfigure the UPS to recognize the line. Unplug the UPS. Press the ON button for 3 seconds to start the UPS on battery. Reconfigure the nominal input voltage for 100 V (see Section 3, Configuration). Press the OFF button to turn the UPS off. Wait 30 seconds for the UPS to reset. The UPS will now recognize the 50 Hz, 100V line. Go to step 2.

2. Plug your UPS power cord into a wall outlet, or other power source.

   Low voltage models (120 V) have a factory-supplied power cord.

   High voltage models (230 V) use a customer-supplied power cord that must be correctly rated. Use a 10 A power cord for 1000-2400 VA UPSs. Use a 16 A power cord for 3000 VA UPSs. You can also use the power cord from your largest load if it is correctly rated.

   Once the UPS is connected, it conducts a self test then goes to Standby mode. If a red Site Wiring or Battery Service LED stays on, consult Section 2, Operation, or Section 5, Trouble-shooting Guide.

CAUTION

DO NOT plug laser printers into a UPS. The high surge currents they produce can disrupt any manufacturer's UPS.

3. Plug your loads (computer, monitor, etc.) into the UPS output receptacles. Use the provided interconnecting line cords where applicable.
4. Start the UPS by pressing the ON button as shown in Figure 2. Power is now available to the rear receptacles, and the ON LED is lit.

You have now completed installation. To learn how to operate the UPS, see Section 2, Operation. To change the factory-set defaults, see Section 3, Configuration.

NOTE

The UPS will charge to 90% in approximately 4 hours. However, it is recommended that you charge for 24 hours after installation or long storage.

SECTION 2

OPERATION

This section explains how to:

- Turn the UPS on and off
- Interpret the LED display
- Put the UPS in Standby mode
- Initiate the self-test
- Discontinue an audio alarm
- Reset the circuit breaker

Turning the UPS On

Once the UPS is connected to a power source, it conducts a self-test and enters Standby mode. To turn the UPS on, press the ON button on the front panel. Power is now available at the rear receptacles.

The UPS can also be started on battery power. To turn the UPS on without using AC input, press the ON button for 3 seconds. When the UPS starts on battery, it conserves battery power by not conducting a self-test.

Turning the UPS Off

To turn the UPS off, press the OFF/Standby button on the front panel and unplug the UPS from the AC power source. If you do not unplug the UPS, it remains in Standby mode.

Interpreting the LED Display

The front panel LEDs indicate how the UPS is functioning and also warn about possible problems. Figure 3 and Table 1 explain how to interpret the LEDs in Operation mode. In Configuration mode, the front panel LEDs provide different information. For more information about how to interpret LEDs in Configuration mode, see Section 3, Configuration.

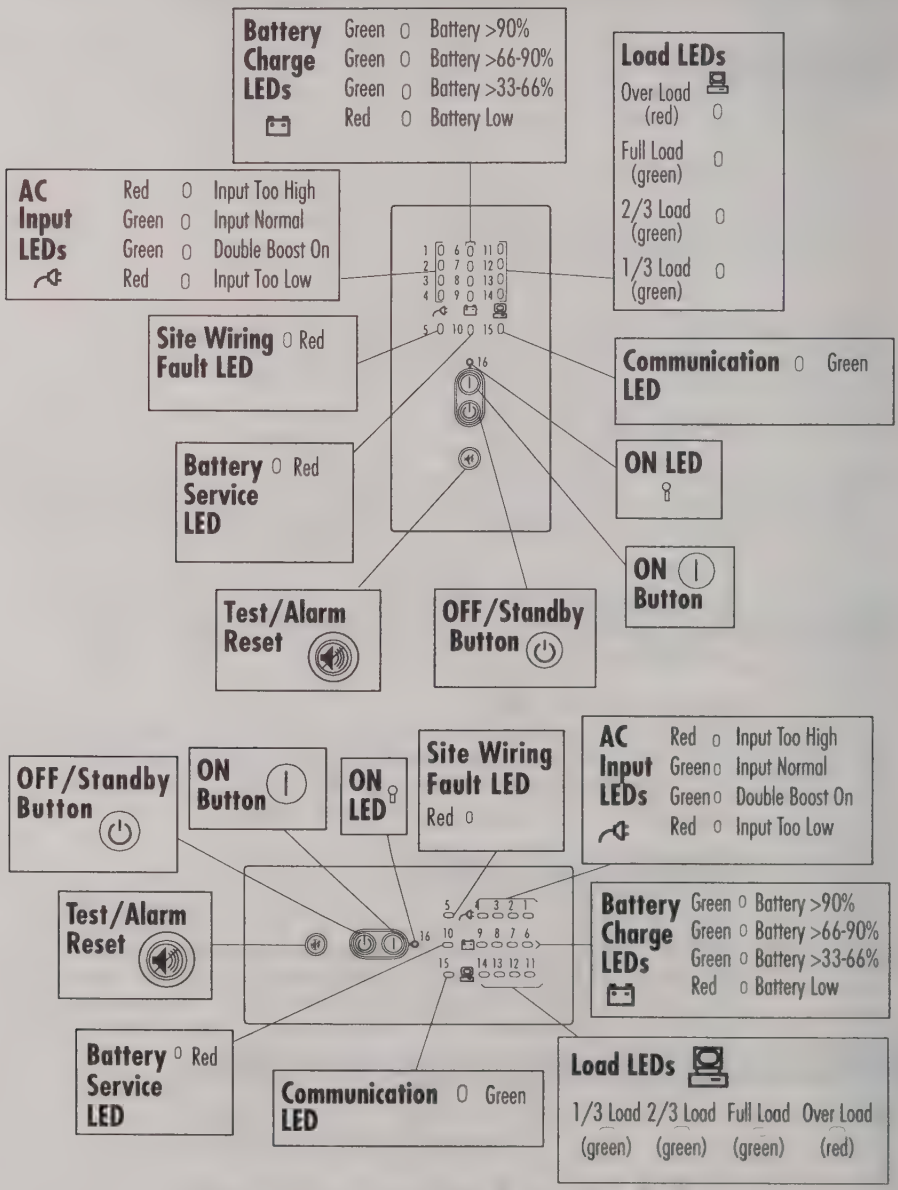


Figure 3. Interpreting LEDs in Operation Mode

Table 1. Interpreting LEDs in Operation Mode

Name	LED Number	Color	Explanation (if lit)
ON	16	Green	Output voltage available at the rear outlets.
AC Input	1	Red	Line voltage is too high; UPS battery provides all power.
	2	Green	Line voltage is normal; AC input provides all power.
	3	Green	Line voltage is lower than normal; AC input provides all power.
	4	Red	Line voltage is too low; UPS battery provides all power.
Site Wiring Fault	5	Red	Ground wire connection does not exist or the line and neutral wires are reversed in the line socket.
Battery Charge	6	Green	Batteries are fully charged.
	7	Green	Battery charge is approximately 2/3 of full charge.
	8	Green	Battery charge is approximately 1/3 of full charge.
	9	Red	Low battery charge: there are approximately 3-5 minutes of battery backup remaining. If the battery shuts down before AC input is restored, the load will shut down.
Battery Service	10	Red	Potential battery failure. An audio alarm accompanies this LED.
Load Level	11	Red	Load current exceeds full load.
	12, 13, 14	Green	These LEDs indicate the amount of load current or watts. Each LED represents 1/3 of a full load rating. When all three LEDs are green, the Load is approximately full.
Communication	15	Green	The UPS has received a command from a computer to establish communication.
		(Flashing)	Data is being transferred via the Communication Port.

Putting the UPS in Standby Mode

To put the UPS in Standby mode, press the OFF/Standby button. In Standby mode, the battery recharges when necessary, but power is no longer available at the rear receptacles.

Initiating the Self Test

Press the Test/Alarm Reset button for three seconds to initiate the self-test. During the test, individual LEDs turn on as various parts of the UPS are checked. If the UPS finds a problem, an audio alarm sounds and an LED turns on to indicate where the problem is. For more information, see the Troubleshooting Guide in Section 5.

NOTE

Batteries must be at least 90% charged (LEDs 6, 7, and 8 must be on) to perform the self test.

Silencing an Audio Alarm

Press the Test/Alarm Reset button to silence an audio alarm. Even though the alarm is discontinued, the problem in the operation of the UPS still must be addressed. For more information, see the Troubleshooting Guide in Section 5.

Resetting the Circuit Breaker

Some units have input and output circuit breakers. If the breaker opens, the UPS may be overloaded. Press the appropriate circuit breaker reset button.

SECTION 3

Configuration

This section explains:

- Why you may want to change factory defaults
- How to reconfigure functions

Why Change Factory Defaults?

Input Nominal Voltage (LEDs 1, 2, 3, and 10)

If your AC input consistently fluctuates higher OR lower than the factory-set nominal input voltage (higher than +20% OR lower than -30% of 120 V or 230 V nominal), your UPS maintains the selected nominal input voltage by repeatedly switching to battery power. If this creates a nuisance, you can configure the UPS nominal input voltage to more closely match the nominal voltage of your AC input source.

Extended Nominal Voltage Range (LED 4)

If your AC input consistently fluctuates higher AND lower than the factory-set nominal input voltage (higher than +20% AND lower than -30% of 120 V or 230 V nominal), your UPS maintains the selected nominal input voltage by repeatedly switching to battery power. If this creates a nuisance, you can configure the UPS nominal input voltage to more closely match the wider range of your AC input source.

Other Settings

Reconfigure LEDs 5, 6, or 8 to change the alarm. Reconfigure LED 7 to change the delay before unconditional shutdown. Reconfigure LED 9 so the UPS does not shut off power to the load when the UPS is on battery power and the load is not drawing current. LEDs 11-14 are inactive and cannot be selected.

Reconfiguring Functions

You can change the functions after switching the UPS from Operation mode to Configuration mode. In Configuration mode, the front-panel LEDs represent changeable functions, and the control buttons turn them on or off. Figure 4 shows the LED numbers, and Table 2 explains the functions.

CAUTION

DO NOT press the Off button while the UPS is in Configuration mode. Doing so places the unit in Standby mode and drops the load.

1. Press the ON and Test/Alarm Reset buttons at the same time for one beep.

   The unit goes to Configuration mode.

2. Press the ON button to scroll to the function you want to change. The UPS beeps as you scroll through each function. The selected function (LED) blinks. Table 2 describes the functions. Figure 4 shows how the LEDs are numbered.

   If you press the ON button and nothing happens, you are still in Operation mode. Repeat step 1 for one beep only to go to Configuration mode, and then perform step 2.

3. Press the Test/Alarm Reset button to turn the selected function on or off. LED 16 turns on when the function is on and off when the function is off. Set the remaining functions as desired.

4. Press the ON and Test/Alarm Reset buttons any time to return to Operation mode. Scrolling through LED 15 also returns the unit to Operation mode. Changes take effect immediately after returning to Operation mode.

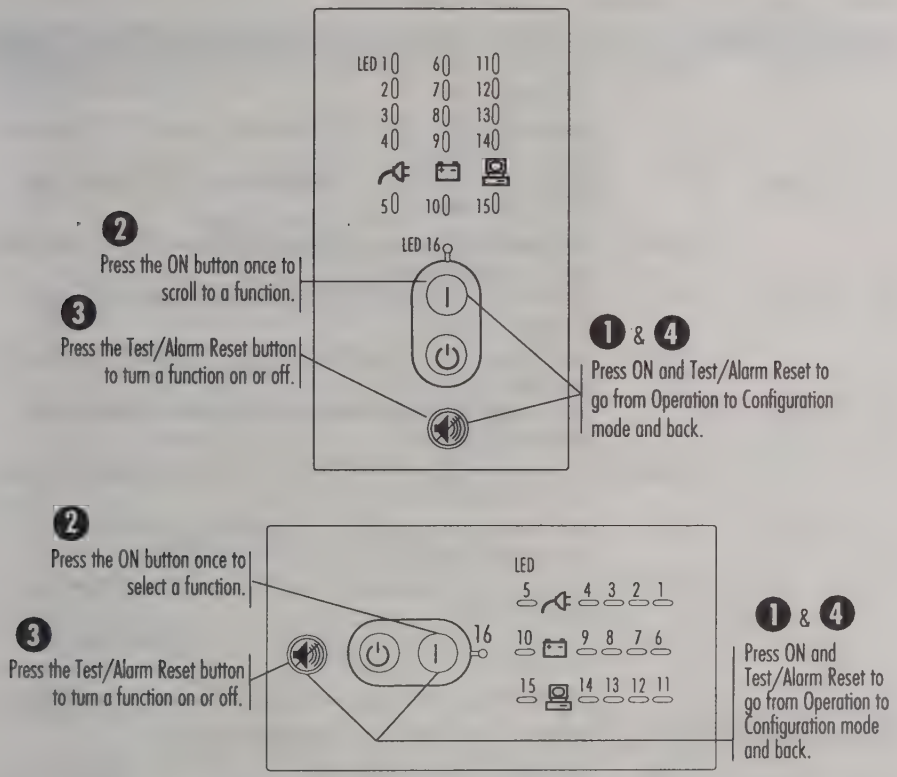

LED 1
LED 16
2
Press the ON button once to scroll to a function.
3
Press the Test/Alarm Reset button to turn a function on or off.
1 & 4
Press ON and Test/Alarm Reset to go from Operation to Configuration mode and back.
2
Press the ON button once to select a function.
3
Press the Test/Alarm Reset button to turn a function on or off.
LED
16
1 & 4
Press ON and Test/Alarm Reset to go from Operation to Configuration mode and back.

Figure 4. LED Function in Configuration Mode

Table 2. How to Interpret LEDs in Configuration Mode

LED	Function	LED16	Explanation
1	120/230 Nom.	ON (default)	Nominal voltage on 120 V models is 120 V and on 230 V models is 230 V; all other nominal input voltages are disabled.
		OFF	Nominal voltage on 120 V models is NOT 120 V and on 230 V models is NOT 230 V; some other nominal input voltage is selected.
2	110/220 Nom.	ON	Nominal voltage on 120 V models is 110 V and on 230 V models is 220 V; all other nominal input voltages are disabled.
		OFF (default)	Nominal voltage on 120 V models is NOT 110 V and on 230 V models is NOT 220 V; some other nominal input voltage is selected.
3	127/240 Nom.	ON	Nominal voltage on 120 V models is 127 V and on 230 V models is 240 V; all other nominal input voltages are disabled.
		OFF (default)	Nominal voltage on 120 V models is NOT 127 V and on 230 V models is NOT 240 V; some other nominal input voltage is selected.
10	100/208 Nom.	ON	Nominal voltage on 100 V models is 100 V and on 208 V models is 208 V; all other nominal input voltages are disabled.
		OFF (default)	Nominal voltage on 100 V models is NOT 100 V and on 208 V models is NOT 208 V; some other nominal input voltage is selected.
4	Extended Voltage	ON	The UPS accepts an input voltage within -35% to +20% of the selected nominal input voltage before switching to battery.
		OFF (default)	The UPS accepts an input voltage within -30% to +20% of the selected nominal input voltage before switching to battery.
5	Wiring Fault Alarm	ON (default)	Alarm sounds when the polarity of the input source is reversed or ground is missing; have a qualified electrician repair input source.
		OFF	Alarm DOES NOT sound when the polarity of the input source is reversed or ground is missing.
6	Low Battery Alarm	ON (default)	Alarm sounds 3 minutes before battery shutdown.
		OFF	Alarm sounds 5 minutes before battery shutdown.
7	Shutdown Delay	ON (default)	5 second delay before unconditional shutdown after UPS receives signal from a computer via Communication Port.
		OFF	180 second delay before unconditional shutdown after UPS receives signal from a computer via Communication Port. When this LED is not enabled, the user can also create a new delay time by reconfiguring the Communication Port. See Appendix C for more information.
8	AC Input Failure Alarm	ON (default)	Alarm sounds when there is an AC input failure.
		OFF	Alarm DOES NOT sound when there is an AC input failure.
9	Sleep Mode	ON (default)	UPS shuts off power to load when the UPS is on battery power and load is not drawing current. This feature saves battery power.
		OFF	UPS DOES NOT shut off power to load when the UPS is on battery power and load is not drawing current.
11-14		N/A	Reserved for future use.
15	Reset Defaults	ON (default)	All factory-set defaults are active.
		OFF	One or more factory-set defaults have been changed.

SECTION 4

MAINTENANCE

This section explains how to:

- Replace your batteries
- Return your used batteries
- Care for your UPS and batteries
- Store your UPS

Replacing Batteries

Your UPS may have internal or external batteries depending on which model you purchased. Both types of batteries are easily replaced without turning the UPS off or disconnecting the load. The following section explains how.

When to Replace Batteries

When the Battery Service LED (LED 10) turns red, your batteries may need replacing. Conduct a self test by pressing the Test/Alarm reset button. If the LED stays on, contact Customer Service to order new batteries.

WARNING

- ELECTRIC ENERGY HAZARD. Do not attempt to alter wiring in either the battery connector or the battery tray. Attempting to alter wiring can cause injury or death.
- A battery can present a risk of high short circuit current which can cause burns. The following precautions should be observed when working on batteries: 1) Remove watches, rings, or other metal objects; 2) Use tools with insulated handles; 3) Do not lay tools or metal parts on top of batteries.
- The battery has no support when you pull it out of the UPS. Pull the battery out onto a flat, stable surface.

CAUTION

- When the UPS is on line, all 3 green battery charge LEDs (6, 7, 8) should be lit before replacing (hot-swapping) the batteries. DO NOT DISCONNECT the batteries while the UPS is on battery power or while the UPS is charging the batteries.
- If you choose to unplug the UPS to change the battery: 1) Remove input power and press the OFF button; 2) Wait 60 seconds while the internal microprocessor shuts down before disconnecting the battery.

How to Replace Batteries

The following illustrations show how to replace your UPS batteries. Consider all warnings and cautions before replacing batteries.

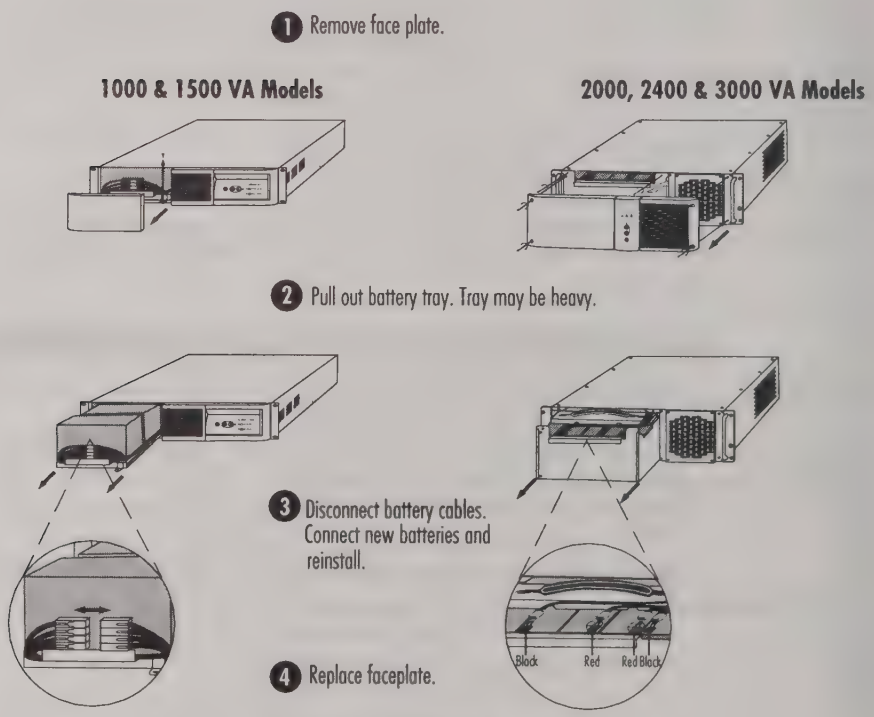

1 Remove face plate.
1000 & 1500 VA Models
2000, 2400 & 3000 VA Models
2 Pull out battery tray. Tray may be heavy.
3 Disconnect battery cables. Connect new batteries and reinstall.
4 Replace faceplate.
Black
Red
Red
Black

Figure 5. Replacing Batteries

Testing New Batteries

After you have replaced the battery, press the Test/Alarm Reset button to start a self test. The red Battery Service LED (LED 10) should turn off and the Battery Level LEDs (LEDs 6, 7, and 8) should show a charge. If the red Battery Service LED stays on, check the battery connections. If it still remains on, see Section 5, Troubleshooting Guide, or call Customer Service.

Battery replacement is now complete.

Returning the Used Battery

Use the packaging from your new battery to return your old battery. Call Customer Service to get information about returning your used battery.

WARNING

- Do not dispose of battery or batteries in a fire. Batteries may explode. Dead batteries are considered a hazardous waste. Return batteries to the factory for proper disposal. It is illegal to dump or improperly dispose of batteries.
- Do not open or mutilate the battery or batteries. Released electrolyte is harmful to the skin or eyes. It may be toxic. The UPS contains sealed lead batteries. Batteries must be recycled.

CAUTION

This product contains sealed lead-acid batteries which must be disposed of properly. For more information, contact your local recycling center or your factory representative.

UPS/Battery Care and Storage

Keep the area around the UPS clean and dust free for the best preventive maintenance. If the atmosphere is very dusty, clean the outside of the system periodically with a vacuum cleaner.

For full battery life, keep the UPS at an ambient temperature of 25°C (77°F).

Storing the UPS

If you store the UPS for a long period, recharge the battery every six months by plugging the UPS into a power outlet. The UPS charges in Standby mode. Charging takes 6 to 24 hours.

UPS Repairs

Repairs on your UPS must be performed by the factory or by factory-authorized service locations. If you have any questions or problems, please contact Customer Service.

SECTION 5

TROUBLESHOOTING GUIDE

The Troubleshooting Guide tells you how to solve problems you may encounter with your UPS.

Table 3. Troubleshooting Guide

Symptom	Possible Cause	What To Do
UPS will not start	Line cord is not connected	Connect line cord
	Circuit breaker on rear panel is open	Push circuit breaker button
	Wall socket is dead	Test wall socket
	Battery fuse or circuit open	Contact service center
	UPS is connected to a 50 Hz,100 V wall outlet	Unplug UPS. Start UPS on battery and reconfigure nominal input voltage for 100 V. See Section 3, Configuration. Turn UPS off for 30 sec., then plug into outlet. See Section 1, Installation, for more details.
Low Battery Alarm does not give enough warning before battery runs low	Batteries need charging or service.	Plug UPS into wall socket for at least 24 hrs. to charge battery, then check battery service LED; replace batteries if necessary
	Alarm not set appropriately	See Section 3 to change the amount of time given before a low battery warning
LED 5 is RED (Site Wiring Fault)	Ground wire or connection does not exist in wall outlet	Have a qualified electrician establish grounding connection
	Line & neutral wires are reversed in wall outlet	Have a qualified electrician correct the wiring
		To ignore fault condition, See Section 3, Configuration
LED 10 is RED (Battery Service)	Potential battery failure	Let UPS go through a full charge cycle by keeping it plugged in for 24 hrs; push Test/Alarm Reset button; if LED does not clear, see Section 4 to replace battery
	New battery improperly connected	Check connections or call Customer Service
Flashing Battery Service LED (LED 10) and alarm won't clear	DC overvoltage condition	Call Customer Service

Troubleshooting Guide continued

Symptom	Possible Cause	What To Do
UPS switches frequently between battery and AC input	Input voltage in your area differs from the UPS nominal	Change UPS nominal input to match local nominal See Section 3, Configuration
LED 10 (Battery Service) is red during initial start up	UPS out of service for a long period	Keep UPS connected to line for at least 24 hrs. and then conduct self test
LED 11 is SOLID RED	Overload condition because load is drawing too much power	Determine if load(s) is defective or if too many loads are connected to UPS; if so, disconnect a load
LED 9 is SOLID RED	3 to 5 min. (depending on configuration) of battery backup left (with normal load and enough charge)	Be prepared to lose battery power to your load(s); save work and turn off equipment
LED 1 is SOLID RED*	Line is high; UPS in battery operation	Correct input voltage problem if possible or be prepared to lose battery power to your load(s) in approx. 3 to 5 minutes (depending on configuration) after Impending Low Battery LED turns on
LED 4 is SOLID RED*	Line is low (power failure); UPS in battery operation	Correct AC input problem if possible or be prepared to lose battery power to your load(s) in approx. 3 to 5 minutes (depending on configuration) after Impending Low Battery LED turns on

* If the UPS continuously displays a solid red LED 1 or 4 above the AC Input symbol, input voltage range can be extended. See Section 3, Configuration, for more information.

APPENDIX A

SPECIFICATIONS

This appendix lists the specifications for all models discussed in this handbook.

Table 4. Model List

Feature	Specification	
UPS Models:	120 Volt Models PRC1000a-RM, PRC1500a-RM, PRC2000a-RM, PRC3000a-RM	230 Volt Models PRC1000i-RM, PRC1500i-RM, PRC2000i-RM, PRC2400i-RM, PRC3000i-RM

Table 5. Electrical Input

Feature	Specification	
Nominal Voltage:	120 Volt Models 120 V default 100, 110, 120, 127 V selectable	230 Volt Models 230 V default 208, 220, 230, 240 V selectable
Voltage Range:	-30% to +20% at full load for nominal voltage, -35% to +20% for short term brown outs	
Nominal Frequency:	120 Volt Models 60 Hz 50/60 if 100 V or 110 V selected	230 Volt Models 50/60 Hz
Connections:	120 Volt Models 6-foot line cord with NEMA plug	230 Volt Models 10A, IEC-320, male inlet on all models except 3000 VA 16A, IEC-320 male inlet on 3000 VA

Table 6. Electrical Output

Feature	Specification	
Power Levels: (rated at nominal inputs)	120 Volt Models PRC1000a-RM: 1000 VA, 670 W PRC1500a-RM: 1440 VA, 960 W PRC2000a-RM: 1920 VA, 1400 W PRC3000a-RM: 2880 VA, 2250 W	230 Volt Models PRC1000i-RM: 1000 VA, 670 W PRC1500i-RM: 1500 VA, 960 W PRC2000i-RM: 2000 VA, 1400 W PRC2400i-RM: 2300 VA, 1600 W PRC3000i-RM: 3000 VA, 2250 W
Regulation On-Line:	+6% to -10%; within Computer Business Equipment Manufacturers Association's Guidelines; (+10% to -15% using extended range)	
Regulation On-Battery: (Nominal Voltage ±5%)	120 Volt Models 120 V for 110, 120, 127 V 100 V for 100 V	230 Volt Models 230 V for 220, 230, 240 V 208 V for 208 V
Voltage Wave Shape:	Sine Wave, 3% THD	
Overcurrent Protection:	On-line: Resettable Circuit Breaker On-Battery: Active current limit and short circuit protection	
Noise Filtering:	MOVs and line filter for normal and common mode noise	
Connections:	120 Volt Models NEMA receptacles (See Appendix B)	230 Volt Models Six or nine IEC-320 outlets (See Appendix B)

Table 7. Battery

Feature	Specification
Voltage:	24 VDC for 1000 and 1500 VA; 48 VDC for 2000, 2400, and 3000 VA
Type:	Sealed, maintenance-free, lead-acid; starved electrolyte
Charging:	Advanced charging for faster recovery; 3 to 8 hours
Monitoring:	Advanced monitoring for earlier failure detection and warning
Backup Time:	At least 5 minutes at full load with a new battery

Table 8. Indicators and Controls

Feature	Specification
Serial Communication:	Intelligent serial communication to provide alarms with history, measured parameters, self-test, and many other features; contact your authorized dealer for UPS/computer communication software options
Interface:	Ergonomic indicators including Wiring Fault, Battery Service, Communication, Operation, System Normal; bar graphs for Input Level, Battery Charge Level, % Load
Contact Closures:	Input Failure, Low Battery

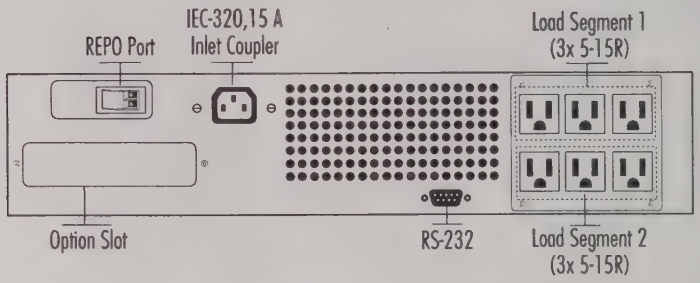
Table 9. Physical Properties

Feature	Specification	
Surge Suppression:	Manufactured with surge suppressors that meet UL 1449	
Operating Temperature:	0°C to 40°C (32°F to 104°F)	
Storage Temperature:	-20°C to 60°C (-4°F to 140°F)	
Relative Humidity:	5 to 95% non-condensing	
Operating Altitude:	3,000m above sea level	
UPS Dimensions:	1000-1500 VA: (WxHxD) 19.0 x 3.5 x 16.0 inches (48.2 x 8.9 x 40.6 cm) 2000-3000 VA: (WxHxD) 19.0 x 5.3 x 22.3 inches (48.2 x 13.3 x 56.6 cm)	
UPS Weights:	120 Volt Models PRC1000a-RM: 58 lbs. (26 kg) PRC1500a-RM: 58 lbs. (26 kg) PRC2000a-RM: 132 lbs. (60 kg) PRC3000a-RM: 132 lbs. (60 kg)	230 Volt Models PRC1000i-RM: 58 lbs. (26 kg) PRC1500i-RM: 58 lbs. (26 kg) PRC2000i-RM: 132 lbs. (60 kg) PRC2400i-RM: 132 lbs. (60 kg) PRC3000i-RM: 132 lbs. (60 kg)
Safety:	120 Volt Models UL 1778 CSA 22.2, No. 107.1	230 Volt Models EN 50091-1 and IEC 60950, UL 1778 CSA 22.2, No. 107.1
Markings:	UL, CSA	CE, VDE, S, FI, N, D, UL, and CSA
EMC:		
Immunity:	ANSI C62.41 Cat B (formerly IEEE 587), EN 50091-2; IEC 61000-4-2,3,4,5	
	120 Volt Models	230 Volt Models
Markings:	FCC and VCCI Class 2 (2000-3000 VA models Class 1)	CE mark
Emissions:	FCC Class B (2000–3000 VA models Class A)	FCC Class B (2000–3000 VA models Class A) EN 50091-2, EN 55022, and IEC 61000-3-2

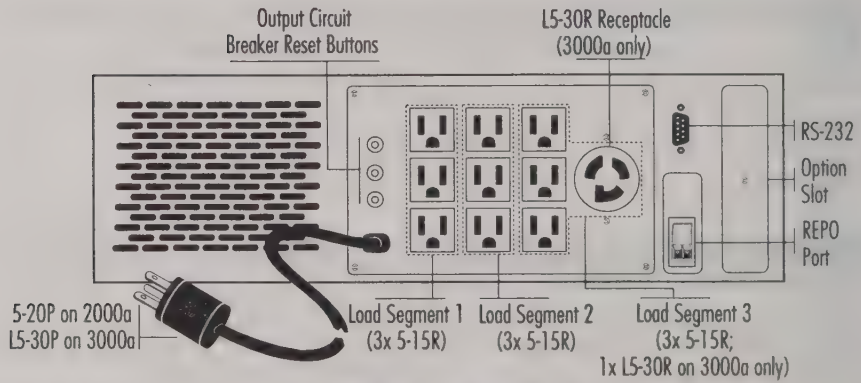
APPENDIX B

UPS REAR PANELS

This appendix shows the rear panels of all models discussed in this handbook.

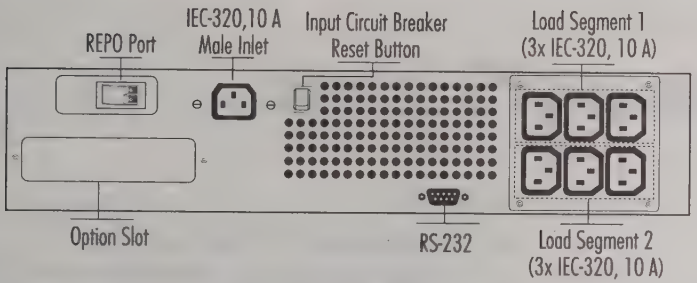


PRC1000a-RM & PRC1500a-RM

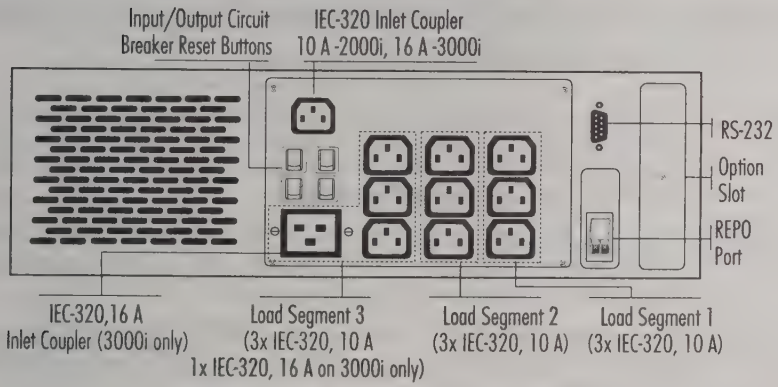


PRC2000a-RM & PRC3000a-RM

Figure 6. 120 Volt Models



PRC1000i-RM & PRC1500i-RM



PRC2000i-RM, PRC2400i-RM, & PRC3000i-RM

Figure 7. 230 Volt Models

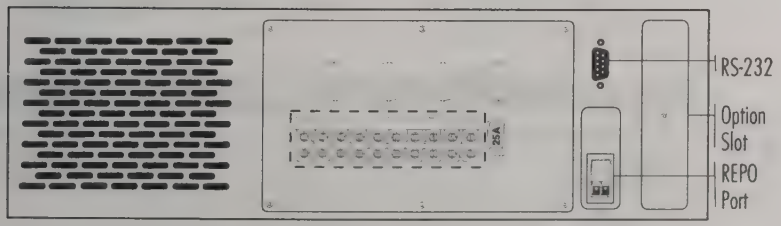


Figure 8. Hardwired Model

APPENDIX C

ADDITIONAL UPS FEATURES

This appendix explains:

- How to use the UPS Communications capabilities
- How to use the Remote Emergency Power Off Switch (REPO)
- Where to find more information about Option Cards
- Where to find more information about Load Segments

Communication Port Configurations

To establish communication between the UPS and a computer, plug the UPS/Computer Interface Cable into the Communication Port. For best performance, use only the factory-supplied cable and software. The UPS operates normally if you do not use this port.

Pins 1 and 2 operate in two modes. The first mode is Basic-Alarms mode with AC fail alarm and output shutdown. The second mode is Serial Data which is UPS Code II compliant.

The system always starts in Basic-Alarms mode. When serial data is received at Pin 1, the function of Pin 1 and Pin 2 changes to Serial Data mode.

When the interface cable is plugged into the Communication Port, the UPS and the connected computer can communicate about UPS operation. See Table 10 for detailed information about each pin in the Communication Port. The Communication Port is used in conjunction with power management software.

CAUTION

To prevent damage to your equipment, connect only a factory-supplied cable or a cable built to factory specifications (see Table 10) to your RS-232 port. A standard serial cable may damage your computer.

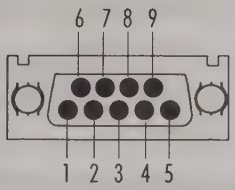


Figure 9. Communication Port

Table 10. Communication Port Configuration

Pin #	Signal Type	Function
1	**Basic Alarms Mode:** Input: RS-232 level high (+12 V) pulse 4 to 5 seconds	Remote UPS off: In absence of AC, output is turned off until normal AC returns
	Serial Data Mode: Input: RS-232 data	RS-232 serial communication input. 1200 baud, 8-bit, no parity, one stop bit, one start bit, Xon/Xoff
2	**Basic Alarms Mode:** Output: RS-232 level high (+12 V)	AC Input failure
	Serial Data Mode: Output: RS-232 data	RS-232 serial communication output. Same as input
3	Output: Open collector transistor ON, 50 mA, 40 VDC rating	AC Input failure
4	Signal Common	Signal Common
5	Output: Open collector transistor ON, 50 mA, 40 VDC rating	Impending low battery
6	Input: RS-232 level low (–12 V)	Plug and Play software enable trigger
7	Input: Relay contact or RS-232 level	Remote output OFF: UPS total output can be kept off with low signal or closing relay contact
8	Output: 8 to 25 VDC, 5 W constant power (0.63 A max. @ 8 V)	Auxiliary Control Power
9	Chassis	Connection to chassis

Remote Emergency Power Off Switch (REPO)

The UPS has a REPO switch that turns the UPS off from a remote location. The following instructions explain how to wire the REPO switch.

NOTE

Activation takes place upon contact closing.

1. Remove the REPO connector from the REPO port on the rear panel of the UPS.

WARNING

DO NOT connect the REPO port to non-SELV circuits. Placing non-SELV voltages on the REPO port may create dangerous conditions for the operator by disabling the safety insulation of the equipment.

2. Connect one wire to PIN 1 and one wire to PIN 2. Use stranded non-shielded wiring, size #22 - #18.
3. Reconnect the REPO connector to the point.

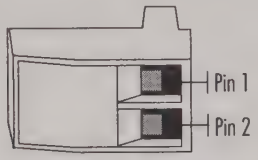


Figure 10. REPO Port

Option Slot

The option slot accepts various option modules that help your UPS communicate in a variety of networking environments. See the manual that accompanies each module for more information, or contact your sales representative.

Load Segments

Load Segments are sets of receptacles that can be turned on and off individually using the optional power management software. For example, during a power outage you can keep key pieces of equipment running while you turn off other equipment. This allows you to save battery power. See your power management software manual for details.

APPENDIX D

HARDWIRING THE UPS

This appendix explains how to wire your power source and loads. Terminal blocks are behind the knock-out plate on the rear panel. Please read Pre-installation Considerations prior to installing.

Pre-Installation Considerations

WARNING

ELECTRICAL SHOCK HAZARD. The hardwired models must be installed by a qualified electrician or technician, or some other qualified personnel. The UPS and batteries may contain HIGH VOLTAGES. These high voltages can injure or kill personnel and damage equipment.

NOTE

- The UPS batteries are sealed and maintenance-free. These batteries give their longest service when used in an ambient temperature of 25° Centigrade.
- Operate the UPS in a protected environment within a temperature range of 0° Centigrade to 40° Centigrade (32° Fahrenheit to 104° Fahrenheit), and a relative humidity of 0-95%, without condensation.

CAUTION

The UPS is very heavy. It is mandatory that a minimum of two people lift, move, set, and position the UPS.

NOTE

Circuit breakers between the UPS and the input source and between the UPS and the output source must be installed prior to operating the UPS, if the UPS is hardwired. Refer to the installation steps in the following section for instruction on the particular input and output requirements.

Steps to Hardwiring the UPS

WARNING

- Electrical Energy Hazard. The battery pack contains HIGH ENERGY. To reduce the risk of electric shock, use caution when you handle and interconnect the units.
- If operating the UPS unplugged from the source of electrical power, DO NOT make contact with the line cord input pins. Electrical Shock hazard exists.
- To reduce the risk of fire or electric shock, install in a temperature and humidity controlled indoor area free of conductive contaminants.
- (VDE requirement) The sum of earth leakage current from all loads connected to the UPS must not exceed 1.5 mA.

NOTE

- Follow the National Electric Code where applicable during installation.
- If the UPS output receptacles are divided into Load Segments, and you plan to take advantage of this feature (available only with specific power management software), read the appropriate sections of your power management software manual before you install the UPS.
- Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

1. Position the UPS where it will be used.
2. Select the input and output wiring to be used to hardwire to the UPS compression-type terminal block. Use the National Electrical Code Article 310, Table 310 (60° Centigrade column only) to determine the appropriate wiring. Table 11, Wire Selection Guide, indicates the recommended wire sizing for input and output. Use only copper conductors and follow all pertinent local electrical codes when selecting wiring.

Table 11. Wire Selection Guide

For These Terminals	Use This Wire Size	Compression Torque
AC Input	10 AWG (5.03 mm²)	30 in/lbs.
AC Output*	10 AWG (5.03 mm²) or 12 AWG (3.31 mm²)	30 in/lbs.

* See Article 310, Table 310 of the NEC

3. Provide an AC input line that meets the UPS electrical input requirements in Appendix A, Specifications. Verify that the operation of the UPS will not exceed the rated capacity of the circuit.
4. Remove the screws that secure the knock-out plate to the rear panel of the UPS.
5. Punch out the appropriate holes in the knock-out plate for input and output wiring.

CAUTION

Punch out only the holes necessary for input and output wiring.

6. Connect flexible wiring conduit to the knock-out holes used. Secure by fastening each conduit to its hole.
7. Route the input and output wiring through the appropriate conduits and up to the terminal block.

CAUTION

To avoid damage, do not remove, cut, or modify any of the wiring connected to the terminal blocks by the factory. For input wiring, connect only ONE WIRE to each terminal. For output wiring, more than one wire may be connected to a terminal. The UPS or your load may be damaged if any of the factory-installed wiring is cut, broken, removed, or modified in any way.

8. Connect your circuit breaker wiring between the input and the UPS, and between the output and the UPS. See Table 12 for the necessary circuit breaker for each unit.

Table 12. Circuit Breaker Size Guide

Model	Input	Output
PRC2000a-RM	20A	15A per load group
PRC3000a-RM	30A	15A per load group
PRC2000i-RM	10A	10A per load group
PRC2400i-RM	20A	10A per load group
PRC3000i-RM	20A	10A per load group

NOTE

The National Electrical Code requires that a circuit breaker device (provided by the customer) must be installed between the input line to the UPS and between the UPS and the output line when hardwired.

9. Connect and secure the ground wires first. The input ground wire must be secured to the Power Safety Ground. The output ground wire can be secured to terminal "G" or the Alternate Output Ground connection. For other wires, proceed to the next step.

WARNING

ELECTRICAL SHOCK HAZARD. The UPS may contain HIGH VOLTAGES. These high voltages can damage equipment and injure or kill personnel. For protection against injury or damage, an AC output disconnect (provided by the customer) MUST be installed between the load and the UPS.

NOTE

If you plan to use the Load Segment feature, refer to the Power Management Software manual for instructions before connecting your load.

10. Check the UPS Identification Label to verify that the power rating for your load matches. Verify that your load is off. Connect and secure input and output wiring using Table 13 and Figure 11.

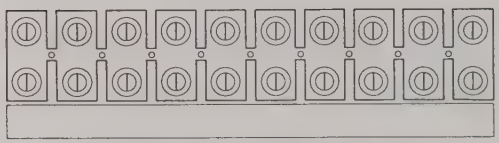


Figure 11. Terminal Block

Table 13. UPS Input and Output Connection Guide*

Connect This Wire	To This Terminal in the UPS
AC Input Ground	Power Safety Ground
AC Input—IL(N)	IL2(N)
AC Input — IL1	IL1
Load Ground	AC Output — Terminal G or Alternate Output Ground Connection
Load Segment 1	
OL2 (N)	OL2 (N)
OL1	OL1
Load Segment 2	
OL2 (N)	OL2 (N)
OL1	OL1
Load Segment 3	
OL2 (N)	OL2 (N)
OL1	OL1

*Note: Tighten all terminal screws to a torque of 12 inch-pounds.

11. Replace the knock-out plate. Then verify that each conduit is seated properly. Hardwiring is now complete.

Disclaimers

The warranties and guaranties below, together with Deltec's standard two-year guarantee, are exclusive and in lieu of all other express and implied warranties whatsoever, including but not limited to implied warranties of merchantability and fitness for a particular purpose.

Deltec shall not be subject to any disclaims: 1) Any other obligations or liabilities arising out of breach of contract or of warranty, 2) Any obligations whatsoever arising from tort claims (including negligence and strict liability) or arising under other theories of law with respect to products sold by Deltec, or any undertakings, acts or omissions relating thereto, and 3) All consequential, incidental, and contingent damages whatsoever.

PowerRite Pro II Rack-Mount Standard Warranty Policy

Deltec Electronics Corporation warrants this equipment, when properly applied and operated within specified conditions, against faulty materials or workmanship for a period of two years from the date of original manufacture. For equipment sites within the United States and Canada, this warranty covers repair or replacement of defective equipment at the discretion of Deltec. Repair will be from the nearest authorized service center. Replacement parts and warranty labor will be borne by Deltec. For equipment located outside of the United States and Canada, Deltec only covers faulty parts. Deltec products repaired or replaced pursuant to this warranty shall be warranted for the unexpired portion of the warranty applying to the original product.

The warranty shall be void if (a) the equipment is damaged by the customer, is improperly used, is subjected to an adverse operating environment, or is operated outside the limits of its electrical specifications; (b) the equipment is repaired or modified by anyone other than Deltec or Deltec-approved personnel; or (c) has been used in a manner contrary to the product's operating manual or other written instructions. When an alarmed failure or field tests suggest that the Deltec equipment may be faulty, whether in or out of the warranty period, a full report of the difficulty should be telephoned to the Customer Service Department at the number listed below. Upon receipt of this report, the Service Department will provide the assistance required to repair or replace the equipment.

Deltec will not be liable for any associated costs incurred by the user, installing contractor, or wholesaler as a direct or indirect result of failure or in the replacement of defective, in-warranty material, unless Deltec grants prior approval. Unauthorized returns of units for in-warranty repairs will be subject to an inspection and handling charge of $50 plus any repair and all transportation charges. The customer must obtain return/replacement authorization from Deltec's Customer Service Department. Indicate the Return Authorization Number that will be provided on the outside of the return packaging materials. The customer is responsible for return shipping charges, shipping insurance, and packaging the equipment securely to avoid shipping damage.

Any technical advice furnished before or after delivery in regard to use or application of Deltec's equipment is furnished without charge and on the basis that it represents Deltec's best judgment under the circumstances, but it is used at the recipient's sole risk.

This warranty is expressly in lieu of all other warranties, expressed or implied, including, without limitation, any implied warranty or merchantability or fitness for a particular purpose, and/or any other obligation or liability on the part of Deltec. The sole and exclusive remedy for breach of any warranty, express or implied, concerning Deltec's products and the only obligation of Deltec hereunder, shall be the repair or replacement of defective equipment, components, or parts; or, at Deltec's option, refund of the purchase price or substitution with a new replacement product. Deltec shall in no way be responsible for any consequential damages, of any kind or nature whatsoever, resulting from the breach of any warranty, express or implied.

Longer term and F.O.B. job site warranties are available at extra cost. Consult the factory for details.

Deltec Electronics Corporation

2727 Kurtz Street • San Diego, California 92110 • (619) 291-4211 • FAX: (619) 296-8039 • 24-Hour Service: 800-848-4734
e-mail: info@deltecpower.com • URL: http://www.deltecpower.com

Extended Ten-Year Pro-Rated Warranty and Computer/ Load Protection Guarantee

Applies *only* to original purchasers for end use in North America who file the attached Warranty Card within 30 days of purchase.

In addition to its standard Two-Year Guarantee and $25,000 Computer/Load Protection Guarantee below, Deltec further warrants its PowerRite Pro Series UPS will have a service life of ten years from the date of shipment from Deltec's factory when used in accordance with the storage, handling, installation, operation, and maintenance procedures prescribed in the following section of this warranty and in the Owner's Manual. "Service life" means the UPS's ability to deliver at least 80% of it original rated backup time.

If Deltec finds that any UPS has not provided the ten-year warranted service life, Deltec will, as its sole obligation and the user's sole remedy for breach of this warranty, repair or replace the unit, at its option, F.O.B. Deltec's factory, for a charge pro-rated on the following basis. The user will be allowed a credit against the list price of equivalent equipment at the time of return to Deltec, in proportion to the percentage of the warranted service life remaining at the time of return to Deltec. (In calculating the available credit, the remaining warranted service life will be rounded up or down to the nearest whole year.) The user will be responsible to pay the balance of the list price of equivalent equipment; and Deltec reserves the right to require payment prior to delivery of the repaired or replacement equipment.

Deltec's complete warranty responsibilities are therefore summarized as follows:

Years 1-2 — Unit Repaired or Replaced Free of Charge

Years 3-10 — Credit ($) = Current List Price X $\frac{\text{Years of Unexpired Life}}{\text{10 Years of Warranted Life}}$

Required Operating Conditions and Extended Ten-Year Pro-Rated Warranty Exclusions

1. The user is required to charge the batteries a minimum of once every six months on units in storage, i.e. not in use. Charging instructions are detailed in the Owner's Manual.
2. Average annual temperature at equipment site shall not exceed 77°F (25°C).
3. The above warranty does not apply to units with broken or damaged enclosures, input cables or output receptacles, or to units that have been frozen or damaged due to neglect, accident, or abuse such as fire, flooding, explosives, or exposure to weather conditions.
4. The above warranty also does not apply to units that have been improperly installed, altered, or tampered with in any way, or if the equipment was not used under normal operating conditions and in accordance with labels and instructions.

Extended Ten-Year Pro-Rated Warranty Claims Procedure

Deltec will not accept any product for return, credit, or exchange unless expressly authorized by Deltec in writing and delivered to Deltec F.O.B. Deltec's factory. Nor will Deltec be responsible for any charges for testing, checking, removal, or installation of a warranted UPS or component part of a UPS.

All defective UPS units and parts, when returned and replaced, become the property of Deltec.

This warranty applies only to the original end user of the equipment and is nontransferable.

$25,000 Computer/Load Protection Guarantee

For the lifetime of the original purchaser who has filed the attached Warranty Card, Deltec promises to repair or replace (at Deltec's option) equipment (valued up to $25,000) that is damaged by an AC power line surge, spike, or other transient when properly connected to Deltec's PowerRite Pro Series UPS (reimbursement for or restoration of data loss excluded). This guarantee applies only in all of the following circumstances:

1. The UPS is plugged in to properly grounded and wired outlets using no extension cords, adapters, other ground wires, or other electrical connections.
2. The installation of the UPS complies with all applicable electrical and safety codes described by the National Electric Code (NEC).
3. The UPS was used under normal operating conditions and in accordance with all labels and instructions.
4. The UPS was not damaged by accident (other than AC power line transient), misuse or abuse.

DELTEC

Extended Warranty Registration Card

Help us help you...

To ensure that we continue to develop the most useful and effective products possible, we'd like to know more about our valued customers. By completing and mailing this registration card within 30 days, you will receive the ten-year pro-rated warranty absolutely free.

Name _____ Title _____

Company _____ Phone _____

Address _____ City _____

State _____ Zip _____ Country _____

Deltec Model # _____ Serial# _____ Date _____

What hardware/equipment are you protecting? ❑ LAN/Server ❑ Workstation ❑ PC ❑ Telecom (PBX) ❑ Process Control ❑ Other

Manufacturer(s): _____ Basic Model(s): _____

How is your equipment used? ❑ Point-of-Sale ❑ Communications ❑ CAD/CAM ❑ Engineering ❑ Graphics/Multimedia ❑ General Business ❑ Scientific/Test ❑ Applications ❑ Accounting/Transaction Processing ❑ Other _____

Why did you buy power protection equipment?

❑ Previous power problems caused damage ❑ To reduce maintenance costs ❑ Preventive ❑ Other _____

Why did you choose our company?

Have you noticed a decrease in power related problems since you installed the UPS? _____

Did you have any problems with installation? _____

Other comments or suggestions: _____

_____

May we refer to you and/or your company in our newsletter or press releases? Yes No

Signature _____

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